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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,829	03/29/2004	Alan D. King	04-100	9996

7590 10/23/2006

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EXAMINER	
FERNANDEZ, SUSAN EMILY	

ART UNIT	PAPER NUMBER
1651	

DATE MAILED: 10/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/810,829	KING ET AL.	
	Examiner	Art Unit	
	Susan E. Fernandez	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25,26,28,29,31,38,40,44,47,49,50,52 and 53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25,26,28,29,31,38,40,44,47,49,50,52 and 53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The amendment filed July 10, 2006, has been received and entered.

Claims 1-24, 27, 30, 32-37, 39, 41-43, 45, 46, 48, and 51 are canceled. Claim 53 is new.

Claims 25, 26, 28, 29, 31, 38, 40, 44, 47, 49, 50, 52, and 53 are pending and examined on the merits.

Claim Rejections - 35 USC § 103

Claims 25, 26, 28, 29, 31, 38, 40, 47, 49, 50, 52, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weidlich et al. (US 5,103,837) in view of Hofmann (U.S. 6,009,347) and further in view of Zewert et al. (U.S. 5,749,847) and/or Widera et al. (Journal of Immunology, 2000, 164: 4635-4640).

Weidlich et al. teaches an implantable, stimulating electrode which is coated with a hydrophilic polymer which comprises an anti-inflammatory steroid (claim 1). The anti-inflammatory steroid diffuses after implantation into surrounding tissue (claim 1). Though not expressly stated, it is clear that when the electrode is implanted, the steroid is delivered into biological cells in the tissues penetrated by the electrode by the electric field applied to the penetrated tissues. Thus, Weidlich et al. discloses limitations in instant claims 25, 29, 31, and 52.

Furthermore, the reference discloses the limitations in instant claim 49 (column 4, lines 1-7). Note further that instant claims 49 and 50 are product-by-process claims. M.P.E.P. § 2113 reads, "Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps."

"Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979)

The use of 35 U.S.C. §§ 102 and 103 rejections for product-by-process claims has been approved by the courts. "[T]he lack of physical description in a product-by-process claim makes determination of the patentability of the claim more difficult, since in spite of the fact that the claim may recite only process limitations, it is the patentability of the product claimed and not of the recited process steps which must be established. We are therefore of the opinion that when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make physical comparisons

therewith." *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972). Thus, Weidlich et al. may be applied to teach the limitations of claim 50 under examination.

Weidlich et al. differs from the claims in that electrodes are not expressly disclosed as being needle electrodes.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have used needle-like electrodes for preparing the Weidlich invention since needles are suitable means for injections in the body. Moreover, it would have permitted access to more deeply located cells in the body.

Additionally, Weidlich et al. does not expressly disclose an electrode assembly, or that the electrode assembly comprises of at least two parallel rows of electrodes.

Hofmann discusses electroporation for use in introducing foreign material into living cells (column 1, lines 9-14 and lines 34-40). Specifically, Hofmann discloses using needle electrodes (column 4, lines 33-35) and notes that "the applicant has found through experimentation that pulsing between multiple pairs of electrodes in a multiple electrode array, preferably set up in rectangular or square patterns, provides improved results over that of pulsing between a pair of electrodes" (column 4, lines 49-53). The electroporation device may comprise of an array of needles as electrodes (column 4, lines 53-61).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have modified the Weidlich invention such that needle electrodes set up in electrode arrays of multiple rows of electrodes are used to create the stimulating electrodes of Weidlich et al. One of ordinary skill in the art would have been motivated to do this because electrode arrays result in improved drug delivery (column 4, lines 49-53). Furthermore, Hofmann

indicates that needle-shaped electrodes allow for access to more deeply located cells (column 1, lines 44-45).

Additionally, Weidlich and Hofmann differ from the claimed invention in that they do not expressly disclose vaccines, including polynucleotide, and DNA vaccines, in the polymeric coating of the implantable, stimulating electrode taught by Weidlich et al.

Zewert et al. teaches the use of electroporation for the delivery of nucleotides into an organism (column 2, lines10-14). More specifically, a composition comprising the nucleotide(s) is applied to the skin, and the skin is subsequently electroporated. The composition applied to the epidermis for drug delivery may include a vaccine (column 4, lines 32-34), and appropriate nucleotides for delivery include polynucleotides, deoxyribonucleotides (column 3, lines 44-46), and ribonucleic acid (column 4, lines 44-46).

Widera et al. discloses DNA vaccine delivery facilitated by electroporation (abstract). Needle array electrodes were used for electroporation following the injection of DNA or a DNA vaccine (page 4636, first column, "DNA immunization and in vivo electroporation").

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have included polynucleotide, DNA, and RNA vaccines in the polymeric coating of the Weidlich electrode to be delivered when applying an electric field. One of ordinary skill in the art would have been motivated to do this because the Weidlich invention involves delivery of a drug (anti-inflammatory steroid), offering a device which accomplishes in a single step the methods of Zewert et al. and procedures performed in Widera et al. Moreover, Widera et al. concludes that "in vivo electroporation substantially increases DNA delivery and

DNA vaccine potency, appears to be well tolerated by the animals, and is a simple technique that takes only a few seconds after inoculation" (page 4640, second paragraph).

Applicant's arguments filed July 10, 2006, have been fully considered but they are not persuasive. It is noted that in the previous office action, Weidlich et al. had been combined with Zewert et al. and Widera et al. to render obvious polynucleotides instead of steroid in the coating of electrode as the drug to be delivered by the electrode. As polynucleotides are macromolecules, the references indeed render obvious all the limitations of the claims. The applicant asserts that Weidlich et al. teaches the delivery of the drug (steroid) into the cells by diffusion, and not by the applied electric field. However, it is respectfully noted that an applied electric field would have affected the delivery of the drug (polynucleotides), and therefore the drug is inherently delivered into biological cells by the applied electric field to some extent.

With respect to Hofmann, it is respectfully noted that Hofmann is used to provide motivation for using electrodes shaped as needles and in an array. It is the primary reference, Weidlich et al., combined with Zewert et al. and Widera et al., that provides the teaching of an electrode with "a coating having at least one static layer of releasable macromolecules to be delivered into biological cells." As such, other aspects of the Hofmann invention besides its needle-shape, including the needles being hollow, or the injection of the drug, are not relied on in the rejection.

With respect to Zewert et al., applicant asserts that the nucleotide component resides in the interstitial spaces between the cells of the organism and does not penetrate into the cells. However, it is respectfully noted that the epidermis is electroporated (thus, pores are formed in the cells of the epidermis) and that the applied composition comprising the nucleotide

component enters the epidermis (column 4, lines 23-25). Since the epidermis comprises of cells, the applied composition is indeed delivered into biological cells. Note further that the claims do not provide any recitation that the released macromolecules must be maintained at its delivery site. Additionally, applicant discusses the differences between the Zewert electrodes and the claimed electrodes. However, as discussed above, the Weidlich electrode teaches an electrode which is for penetration into tissues, and with a static layer coating comprising releasable molecules.

With respect to Widera et al., though Widera et al. teaches a process for drug delivery involving multiple steps and apparatuses, it is respectfully noted that Widera et al. is provide to provide motivation for the delivery of nucleotides by the effects of an applied electric field. As explained above, the Weidlich reference teaches many of the limitations of the claimed invention, with the exception of a coating comprising nucleotides to be delivered.

Thus, a holding of obviousness is required.

Claims 25, 26, 28, 29, 31, 38, 40, 44, 47, 49, 50, 52, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weidlich et al., Hofmann, Zewert et al., and Widera et al. as applied to claims 25, 26, 28, 29, 31, 38, 40, 47, 49, 50, 52, and 53 above, and further in view of Lerner (WO 97/18855).

As discussed above, Weidlich et al., Hofmann, Zewert et al., and Widera et al. render claims 25, 26, 28, 29, 31, 38, 40, 47, 49, 50, 52, and 53 obvious. However, these references do not expressly disclose protein-based vaccines in the polymeric coating of the implantable, stimulating electrode taught by Weidlich et al.

Lerner discloses a drug delivery device comprising electrodes supporting a "drug or other biologically active substance or compound" (claim 9). Furthermore, drugs or other biologically active substances for delivery include bacterial vaccines (page 28, line 7), proteins (page 28, line 19), and viral vaccines (page 28, line 22).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have included protein-based vaccines in the polymeric coating of the Weidlich electrode to be delivered when applying an electric field. One of ordinary skill in the art would have been motivated to do this because Lerner teaches that a variety of drugs can be delivered when using electrodes. It would have been desirable to deliver protein-based drugs for vaccination of bacterial and viral diseases. Moreover, since the Weidlich electrode is suitable for delivering a drug (anti-inflammatory steroid), one of ordinary skill in the art would have recognized the suitability of delivering other drugs in the same manner by including the drug in a coating on the electrode.

Applicant's arguments have been fully considered but they are not persuasive. Applicant asserts that since Lerner deals with iontophoresis, Lerner does not teach the step of delivering material into cells. However, since Lerner clearly teaches the delivery of drugs into tissues, and since tissue comprises cells, the drug must be delivered into cells. Though Lerner does not teach needle electrodes which penetrate tissue and comprising a coating of releasable molecules, it is respectfully submitted that the Weidlich electrode meets those embodiments (and in combination with other references, teaches a coating of releasable macromolecules).

Thus, a holding of obviousness is clearly required.

No claims are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan E. Fernandez whose telephone number is (571) 272-3444. The examiner can normally be reached on Mon-Fri 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on (571) 272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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